

area approached, marked by east winds blowing from a continental region of high pressure in the south. The storms so characteristic of the south polar region were here experienced in their full force. Although the only land actually inspected was the solitary peak of the "Gaussberg," the whole character of the neighbourhood, with its vast sheet of "inland-ice," was such as to argue the existence of a continental mass stretching southward from the Antarctic circle. The ancient crystalline character of the rocks and the sudden fall towards a deep sea in the north point in the same direction. Valuable observations of the ice-conditions, both of the sea and land areas, were made, and the paper in the *Zeitschrift* is accompanied by excellent photographic representations, one showing the stratified formation of an iceberg being especially noteworthy.

THE "FISH HYPOTHESIS" AND THE TRANSMISSION OF LEPROSY.

LEPROSY is a disease that has been known from the earliest times, and in the British Isles was very prevalent in the twelfth and thirteenth centuries. At the present time, though unknown in many countries, it is impossible to traverse any large tract in any continent without meeting with cases, Norway, the Mediterranean littoral, India, China, certain of the Pacific islands and various parts of America and Africa being preeminently the seats of the disease. A bacillus having a strong resemblance to the tubercle bacillus is present in enormous numbers in the leprosy tissues, and is regarded as the specific virus, though it is non-inoculable into animals, and, with doubtful exceptions, has never been cultivated.

The transmission of the disease is generally regarded as being due to personal contagion, and there are many facts in support of this view. Segregation of the lepers is believed to be eradicating the disease in Norway; the introduction of a case of leprosy into a place previously free has been followed by a great spread of the disease, as in the Loyalty Islands, and many instances are on record of persons contracting the disease after associating in some way with the sick, whose secretions swarm with the bacilli.

For some months past, Mr. Jonathan Hutchinson, F.R.S., has been strenuously maintaining his "fish hypothesis" of the origin and transmission of leprosy with an ardour and with a wealth of facts and figures that must strike all with admiration. Moreover, Mr. Hutchinson has recently undertaken two journeys, to India and to the Cape, in order to collect data in support of his hypothesis, no light undertakings for a man of his years! Briefly stated in his own words, "the fish hypothesis assumes that in all ages and in all countries, leprosy has been and still is due in the main to the consumption as food of decomposing or imperfectly cured fish. It is thought probable that the disease is a modification of tuberculosis, and that it receives modification in connection with some specific virus (toxin or bacillus) which is occasionally, but by no means frequently, developed in connection with such fish. It assumes that, if the virus be present, a very small quantity of fish may suffice to produce the disease in its full vigour, whilst, if it be absent, large quantities may be habitually consumed without any result. It is a specific poisoning which occurs, and by no means merely a form of ill-health due to unwholesome diet. It has no degrees of less or more, and is either contracted in its totality or wholly escaped. Thus, all who eat fish in bad condition are supposed to run some risk; and those who eat it habitually and largely encounter that risk more frequently than others. It is, however,

the quality and not the quantity with which chiefly we are concerned—the presence or absence of the specific virus. For the present the existence of such a virus is a matter of hypothesis, for it has never been isolated from any specimen of fish. Thus the evidence is circumstantial, not demonstrative."

Mr. Hutchinson has directed attention to the incidence of leprosy among Roman Catholic communities; this he attributes to the use of fish during the fasts ordained by that Church. Believing, as he does, that personal contagion plays little or no part in the spread of the disease, he advocates the abolition of leper asylums or at least a great mitigation in the severity of the laws as regards segregation, especially in Cape Colony.

Mr. Hutchinson's hypothesis is doubtless supported by many facts, and there is a remarkable coincidence between fish-eating and leprosy districts. Thus in India generally the incidence of leprosy is about three or four cases per 10,000 of the population, but in the island of Minicoy, devoted to fishing, it rises to 150, and in Kaligoan, a fish-curing centre, to 500. The decline of leprosy in the British Isles he would attribute to the improvement in the food of the people and to the introduction of the reformed faith, whereby fasting was abolished. There are, however, grave difficulties in the way of accepting the fish hypothesis as proved. It is almost certain that leprosy is met with among peoples who rarely or never touch fish, e.g. the Basutos, as pointed out by Dr. Turner. Mr. Hutchinson has controverted this statement, alleging that Dr. Turner's witnesses were not to be believed, but surely the same argument may be applied to much of Mr. Hutchinson's own evidence. Mr. Hutchinson states that on several occasions he has by cross-examination obtained an admission of fish-eating that had previously been denied. But the cross-examination of an ignorant and perhaps terror-stricken native by a casual visitor is hardly calculated to elicit the truth, and must be carried out with the greatest circumspection or the examinee will infallibly admit that which he believes is required of him. On this ground much of Mr. Hutchinson's evidence must be regarded as untrustworthy. Then there is the difficulty as to why fish in bad condition conveys the disease, whereas good fish, fresh or dried, is innocuous. Why is the virus present in bad fish and not in fresh fish, where does it come from, and how does it get there? These are questions that require an answer, for it is admitted that the leprosy bacillus has never been met with apart from the leprosy person; there is absolutely no proof, or even suspicion, that fish harbour the leprosy bacillus. Orkney and Shetland formerly suffered greatly from leprosy, but Mr. Traill Skae, in a letter to the *British Medical Journal*, entirely denies that the food of the people has much improved and asserts that enormous quantities of bad fish are still consumed. It would seem much more likely that the civilisation of a people that will eat bad fish is low and that promiscuous intercourse of all kinds is, therefore, habitual, leading more readily to personal contagion; this would explain the connection, if there be one, between the consumption of bad fish and leprosy.

As regards segregation being useless, Dr. Ehlers states that in Iceland, during the five years after the opening of the asylum in 1899, the number of lepers, which had previously been increasing, diminished by one-fourth. The statement that segregation is useless is against all experience, though there is, doubtless, much to be said for a modified form of segregation and for a revision of the leprosy enactments in Cape Colony.

With regard to the remarkable waxing and waning of leprosy in many countries, this is seen in nearly every

infective disease. A disease introduced into virgin soil is apt to spread rapidly; where the soil is not virgin there is frequently a periodicity which at present cannot altogether be explained. Thus the ordinary "zymotic" diseases in the British Isles, diphtheria, scarlet fever, &c., have a seasonal and an epidemic periodicity; other diseases, notably influenza and plague, may for years be almost unknown, and then an epidemic prevalence may become established over such large areas that the disease becomes pandemic. The same unknown causes may have much to do with the extinction of leprosy in the British Isles and elsewhere.

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NOTES.

THE Russian Imperial Geographical Society has conferred the Lütke gold medal—its highest distinction—on Sir John Murray, K.C.B., F.R.S., for his oceanographical and limnological researches. The medal has only once before been conferred on a foreigner, namely, Prof. Suess, of Vienna, the eminent geologist.

MR. JAMES HORNELL, who acted as Prof. Herdman's assistant during the Ceylon pearl oyster investigation, has been appointed marine biologist to the Government of Ceylon, and inspector of the pearl banks. Mr. Hornell is now preparing for an inspection by means of dredges in place of divers, with the view of carrying out the changes recommended in Prof. Herdman's report. The appointment is of interest as showing how in the recognition of science some of our colonies are in advance of the mother country. We have no "marine biologist to the Government" here.

DR. J. E. MARR, F.R.S., was elected president of the Geological Society at the anniversary meeting held last Friday. Sir Archibald Geikie delivered the anniversary address, his subject being continental elevation and subsidence. The medals and funds at the disposal of the society were presented as already announced (p. 255).

THE death is announced of Prof. Callandreau, professor of astronomy in the Paris École polytechnique, and member of the Paris Academy of Sciences.

AN astronomical society has been formed at Newcastle-upon-Tyne under the presidency of the Rev. T. E. Espin, who will give the first lecture, at the Literary and Philosophical Society's rooms, on Friday, March 11, on "The Work of an Amateur Observatory." The hon. secretary of the society is Mr. J. D. Hastings, Warkworth House, Tynemouth.

A BILL for rendering compulsory the use of the metric system of weights and measures in the United Kingdom was read a second time in the House of Lords on Tuesday and referred to a select committee. The Bill provides that the metric system shall become compulsory on April 5, 1906, or at such later date as may be directed by His Majesty by Order in Council. It is, therefore, left to the discretion of the Government to fix the date for inaugurating the compulsory adoption of the system. In moving the second reading of the Bill, Lord Belhaven referred to the recommendations of the Select Committee of the House of Commons in 1895, and pointed out the educational and commercial advantages which would follow the adoption of the metric system in the place of our present irrational standards. Lord Kelvin, speaking in support of the Bill, remarked that in Germany, France, and Italy, no inconvenience had resulted from the introduction of the metric

system. He said it was of interest to know that the decimal system originated in England. In a letter dated November 14, 1783, James Watt laid down a plan which was in all respects the system adopted by the French philosophers seven years later, which they suggested to the King of England as a system that might be adopted by international agreement. James Watt's objects were to secure uniformity and to establish a mode of division which should be convenient as long as decimal arithmetic lasted. Speeches in favour of the Bill were made by Lord Wolverton, the Marquis of Lansdowne, and the Earl of Rosebery.

THE Reale Accademia dei Georgofili, of Florence, offers a prize, a diploma, and a silver medal for the best essay on the fiscal policy in Italy in relation to that of other countries from the introduction of the 1887 tariff to the end of 1903. The competition closes on June 30, 1905. The Olympic Academy of Venice offers a prize, the subject being Italian emigration in South America, and the last day being December 31, 1906.

THE *Revue générale des Sciences* contains an account, by M. A. de Lapparent, of the life and work of M. Munier Chalmas, who died at Aix les Bains on August 8, 1903, scarcely three months after his election into the Académie des Sciences. M. Munier Chalmas was born in the Beaujolais district in 1843, and at the age of fourteen his interest in geology was aroused by his meeting a geological party of students near Paris, conducted by M. Hébert. At nineteen he had studied under Cordier and D'Orbigny. On the death of M. Hébert in 1890 a movement was set on foot to appoint him to the chair thus vacated at the Sorbonne. M. Munier Chalmas's contributions to palæontology were numerous and varied, and dealt with the calcareous algal remains previously regarded as Foraminifera, the dimorphism of Nummulites and Milolidae, the classification of echinids, the morphology of brachiopods, and the embryonic development of ammonites. The present state of our knowledge of the geology of the Paris basin is largely due to his researches. He rendered valuable services in the preparation of the geological map of France, and his investigations extended also to Dalmatia and Hungary.

THE death is announced of Prof. Arthur W. Palmer, head of the department of chemistry of the University of Illinois. Prof. Palmer, says *Science*, graduated from the University of Illinois in 1883, and was for two years assistant in the department of chemistry. In 1890, after studying for two years at Harvard University and one year in Germany, he was appointed professor of chemistry, and has since served continuously in that capacity. As member of the Chemical and Biological Survey, he had lately completed an important report on the water supply of the State of Illinois, and was the author of many papers embodying the results of chemical investigation.

AT the annual general meeting of the Institution of Mechanical Engineers on February 19, the annual report of the council for the year 1903 was presented, and contains the following announcements among others. The sixth report of the Alloys Research Committee has been completed. It deals with the experiments made, under the late Sir William Roberts-Austen's direction, on the tempering and annealing of steel, by Mr. William H. Merrett and by others. At the request of the committee the report was completed by Prof. Gowland. The first report of the Steam-Engine Research Committee, by Prof. D. S. Capper, has been received, and will shortly be presented. Prof. Burstall reports that the 100 B.H.P. gas engine which has been designed for experimental work in connection with